DOCUMENT RESUME

ED 306 967 JC 880 600

AUTHOR Starnes, Paul M.; Johnson, Berman E.
TITLE Educational Initiatives for Industrial Development in Georgia.
PUB DATE Feb 88
NOTE 7p.; In: Engineering and Economic Development: A Critical Linkage. Proceedings of the College Industry Education Conference of the American Society for Engineering Education (San Diego, CA, February 8-12, 1988).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College Role; Curriculum Development; *Economic Development; *Engineering Education; Engineering Technology; Pilot Projects; Program Development; Program Effectiveness; Research and Development Centers; *School Business Relationship; State Boards of Education; State Programs; Statewide Planning; *Technical Education; *Technical Institutes; Two Year Colleges
IDENTIFIERS *Georgia

ABSTRACT

Georgia's two-year technical institutes have played a prominant role in linking education with industry. Five major interrelated efforts have worked to transform the state from an agrarian economy to one utilizing advanced technologies. The first of these, the Quick-Start Program, offers state-paid services, such as consultation, employee recruitment, pre-employment screening, and on-the-job training, to new or expanding industries. Second, the Advanced Technology Development Center of the Georgia Institute of Technology serves as a business incubator for new companies, reduces business risks for advanced technology companies, and links the creation of new jobs to entrepreneurial innovation. Third, a study was conducted to define directions and strategies to meet advanced technology training needs at two-year colleges and to assist technical institutes in serving new industry attracted to the state. Fourth, a standard engineering technology curriculum was created for six pilot technical institutes to offer an Associate Degree in Applied Technology on a trial basis. Finally, the State Board of Postsecondary Vocational Education was created as a separate government agency to oversee engineering technology education and the role of postsecondary education in industrial development. These initiatives have had a signficant impact on initial plant operations; the development of a pool of paraprofessionals with adaptable skills for advanced technologies; and research and development. (AAZC)

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Paper presented at the College Industry Education Conference of the American Society for Engineering Education, February 8-12, 1988, San Diego, California.

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Educational Initiatives for Industrial Development in Georgia

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Two-year technical institutes have played a prominent role in linking education with industry, and the primary beneficiaries have been the citizens of Georgia. The industry/education initiatives stem from a state educational mission which emphasizes linkages with business and industry. The initiatives have been a key factor causing unprecedented economic growth and development in Georgia for the past 25 years. Concurrently, linkages between higher education and industrial development have enhanced the image of technical education, spearheaded a statewide engineering technology curriculum, and encouraged advanced technology industries to relocate in Georgia.

Initiatives from higher education in Georgia can be identified in four areas: The Georgia Quick-Start Program, The Advanced Technology Development Center at Georgia Tech, the establishment of a standard curriculum in engineering technology, and the creation of the State Board of Postsecondary Vocational Education (SBPVE). These areas are interrelated and focus upon efforts to transform the state from an agrarian economy to one facilitating utilization of advanced technologies.

The modern thrust for economic development in Georgia began in the late 1950s with active efforts made by the Governor and other visionary leaders of the educational and business community. Their central concern was to stop the out-migration of talented persons from Georgia's work force and to attract new industry to the state. But it was obvious that Georgia's talented work force had few job opportunities, and industries would not readily relocate to Georgia because its educational systems were perceived to be inadequate. Upgrading the educational systems became a high priority, and it was followed by a series of legislated reforms at all levels aimed at economic development for the entire state.

In higher education, the Georgia General Assembly created public two-year postsecondary technical institutes, at that time called area vocational-technical schools, which were strategically located throughout the state. Each had programs of electronics and machine shop installed primarily for purposes of attracting new industry to each community. This bold step was made on speculations for industrial growth and not on community needs assessments. However, it quickly reversed the out-migration problem, it was the embryo for two-year engineering technology education in the state, and it promoted industrial development in each community. Presently, there are 28 technical institutes in the state, and four new ones have been funded by the state legislature for construction during 1988 and 1989.

The Quick-Start Program

The technical institutes housed the first formal linkage between higher education and industrial development when in 1968 the Quick-Start Program was established. The Quick-Start Program offers state-paid services to new or expanding industries in the form of consultation, tailor-made training courses, employee recruitment, pre-employment screening, and on-the-job training. It can provide short-term training including from two to 150 hours of instruction.

The Georgia General Assembly passed legislation for the QuickStart Program specifically for economic development, and it proved to be a powerful incentive for attracting new companies providing new jobs. A recent example of its success is illustrated in data from 1986 when 180 companies located or expanded businesses in the metro-Atlanta area alone. This growth provided 68,000 new jobs. However, the greatest volume of Quick-Start Program activity takes place outside of metroAtlanta where these figures are even higher. Because of its 20 years of success in helping new and existing companies through the Quick-Start Program, Georgia is recognized as a national leader in educational linkages for industrial development.

The ATDC at Georgia Tech

Companies utilizing advanced technologies in Georgia also stressed the need for a pool of highly skilled persons with two-year degrees in engineering technology as well as graduate programs in science and engineering. At the same time in 1980, the Governor, the Georgia General Assembly, and leaders from the Georgia Board of Regents created The Advanced Technology Development Center (ATDC) unit of the Georgia Institute of Technology. Its primary purpose was to assist in the growth of advanced technology and to strengthen the state's economy through advanced technology development.

The ATDC subsequently became one of the nation's most respected technology development centers, and it focuses on linkages between education and industry with state government support to accomplish its missions. It serves as a business incubator for advanced technology companies in Georgia, for new companies as well as for established companies. It also reduces perceived business risks, enhances opportunity for business success, and links the creation of new jobs to entrepreneurial innovation. With its heavy emphasis on research and development dedicated for local and national industry, the ATDC has grown to become one of Georgia's prominent linkages between higher education and industrial development. This climate on the Georgia Tech campus demonstrated a potential to provide directions for the two-year technical institutes as they began to adjust to the modern needs of advanced technology.

An Advanced Technology Study

It was noted in 1980 that the technical institutes could play an important role in providing a readily available skilled work force needed for economic development in the state. That challenge was answered by state leaders in Program Development in the Georgia Department of Education, Office of Vocational Education. The Governor and state leaders in education and industry felt that the technical institutes were the critical link between industry and economic development. But leaders in Program Development feared that the technical institutes might not keep pace with advancements in technology. Consequently, in June 1981 the Office of Vocational Education contracted with Georgia Tech to produce An Advanced Technology Study. This exhaustive study was meant to define directions and strategies which could meet the training needs in advanced technologies at the two-year level, and to assist the technical institutes in providing a competitive edge for new industry attracted to the state.

An Interim Report was published within four months and immediately impacted state budget planning. Thus, even before the Study was completed the Governor took immediate action to demonstrate his support and commitment to upgrading the state's technical institutes. That action included the following:

1. Establishment of an $8 million budget to upgrade technical equipment.
2. Three pilot technical institutes were chosen to accelerate the implementation of advanced technology programs. They included technical institutes in DeKalb County (Atlanta area), Augusta, and Columbus. The number of pilot technical institutes was later increased to six by adding the institutions located in Marietta, Savannah and Athens.
3. A Governor's High Technology Advisory Council was appointed and a position for a High Technology Coordinator and Executive Secretary to the Council was established.
4. A curriculum based upon Accreditation Board of Engineering Technology (ABET) criteria was proposed for Associate in Applied Technology Degree programs to be installed in the six technical institutes.

The fourth action, a curriculum based upon ABET criteria, was particularly important and was reflective of the peculiar status of two-year technical institutes in Georgia. At that time the technical institutes could provide Associate Degrees only through cooperative agreements with colleges governed by the University System of the Georgia Board of Regents. The technical institutes were governed by the State Board of Education, the agency which also governs K-12 education. Many felt that this detracted from their status and public perceptions of their being institutions of higher education. It also emphasized that the highest credential awarded by the technical institutes did not have the cognitive component demanded by many advanced technologies.

A notable exception was DeKalb Technical Institute which then was an integral part of DeKalb Community College. Their long association largely contributed to DeKalb Tech's lead among two-year institutions in curriculum development where cognitive skills were merged with technical skills. DeKalb Tech had for years awarded the Associate Degree through its parent organization, DeKalb Community College; it had substantial linkages with local and regional indus-

try; and it produced quality graduates with outstanding technical as well as cognitive skills. It was expected that DeKalb Tech would consolidate these resources to become the first two-year institution in the state to earn ABET accreditation, and thereby show the way for other technical institutes to follow.

The Final Report of An Advanced Technology Study completed in September 1982 ushered in a new era for two-year technical institutes in Georgia. The technical institutes began to develop stronger linkages with industry, they began to assume more characteristics of two-year colleges, and they began to develop curricula which better suited the employment needs of business and industry. In the Study, Georgia Tech surveyed a broad spectrum of employers who were producers and users in the advanced technology sector. They interviewed firms outside of Georgia as well as in-state to generate a comparison of industry perceptions towards technical education. The overall analysis of the Study indicated that Georgia firms required a mixture of electronics, electromechanical, and mechanical skills at the engineering technician level.

Georgia Tech also surveyed the technical institutes to find deficiencies in equipment and in certain basic technical and general education skills. The technical institutes also lacked qualified students, specificity in training programs, and teacher-updated skills commensurate with those in the advanced technologies.

A Standard Engineering Technology Curriculum

The Study concluded that a more significant cognitive component was needed in engineering technology programs as specified in ABET criteria. This included updated courses in mathematics, physics, communications, business, and social sciences that needed to be incorporated in the proposed Associate in Applied Technology Degree. It also recommended a standard engineering technology curriculum for the six pilot technical institutes which would offer the Degree. Accordingly, the six technical institutes collaborated with the State High Technology Coordinator to develop a standard curriculum in three designated areas: Electronics Engineering Technology, Electromechanical Engineering Technology, and Mechanical Engineering Technology.

Development of the standard engineering technology curriculum also included collaboration with a curriculum committee composed of key employers selected from advanced technology companies throughout the state. Prominent among them were Scientific Atlanta, Rockwell International, Pratt and Whitney Aircraft, and the Turner Broadcasting System which provided valuable input for a curriculum that was acceptable for all regions of the state. This was no small task because of the wide diversity of industrial thrusts in the state and the extensive course upgrading that was needed at several of the technical institutes. Presently, only DeKalb Tech has implemented the curriculum to satisfy ABET accreditation and regional college commission accreditation. However, the other pilot technical institutes are steadily moving in that direction.

The standard curriculum for engineering technology education serves as a model for similar efforts in other areas of technical education. State governance recognized that technical education had developed programs with standards that were too dissimilar from institution to institution. Hence, what had been accomplished for three programs in the engineering technologies was now pursued for more than 80 other programs throughout the state. A Standards Committee composed of members of the SBPVE was organized with the primary purpose of establishing standards for the curricula in all programs of the technical institutes. Like the effort made in engineering technology which emphasized strong linkages with the industrial sector, the more global effort was spearheaded by members of the SBPVE who have vested interests in industrial development. This vital linkage with industry was made by design and was an integral part of the SBPVE being established in 1985.

Creation of the SBPVE

The State Board of Postsecondary Vocational Education was created in July 1985 with a mandate that its 15 members consist of persons who are selected by the Governor from business and industry. There is one member from each of the ten congressional districts in the state and five at-large members. It marked the addition of a third governing agency for public education in Georgia and paved the way for the technical institutes to offer Associate Degrees. It was strongly felt that the agency governing K-12 education should not be in a position to approve academic degrees. However, linkages with the industrial sector emphasized the need for an Associate in Applied Technology Degree and the establishment of a governing agency to approve it.

The creation of a separate governing agency for postsecondary technical education had been promoted for years by key administrators, especially those at the six urban degree-granting technical institutes. Several administrators noted that the six urban degree-granting technical institutes competed with liberal arts colleges for student enrollment, especially since the standard curriculum in engineering technology had elevated student entry requirements. Many argued that the technical institutes needed to shed all vestiges of a K-12 image in order to attract high school graduates who want to enroll in institutions which are perceived to be higher education. Thus, the creation of the SBPVE not only facilitated the needs of engineering technology education, it stimulated the delivery system for the technical institutes, and solidified governance in postsecondary education with industrial development throughout the state.

Conclusion

These four linkages of higher education with industrial development have had a significant impact on economic development for the State of Georgia. While the Quick-Start Program is Georgia's most effective linkage to implement initial plant operations, the development of an updated standard engineering technology curriculum is the most ambitious effort to produce a constant pool of paraprofessionals with adaptable skills for the advanced technologies. While the Advanced Technology Development Center is Georgia's most prominent linkage with industry requiring extensive research and development, the State Board of Postsecondary Vocational Education more intimately addresses the fact that 80 to 90 percent of the working population require skills at less than the baccalaureate level. These linkages cannot be denied, yet they are not without problems which hinder their more complete effectiveness.

Engineering technology education in Georgia has enrollment and retention problems of some magnitude. While the need for two-year graduates in Electronics, Electromechanical, and Mechanical Engineering Technology persists, the six urban degree-granting technical institutes where these programs have been installed are not attracting and enrolling a sufficient number of qualified students commensurate with that need. Although the Electronics programs have encountered less enrollment problems, many claim that the names of the other two programs are not readily accepted or understood by potential students. While some stress the need to educate potential students concerning these two programs, others see the need to change the names to titles which are more attractive to potential students and to the general public.

Strong linkages between technical education and industry are but the first step in promoting industrial development in Georgia. Equally important is to nurture the development of strong linkages with the clients whom we serve. This includes K-12 education where attitudes towards studies in the advanced technologies are often diverted to favor other academic studies, four-year institutions which often do not articulate with quality two-year technical institute degree programs, and the general public which is not yet fully aware of the significant role that two-year technical education can play for economic development. This will require a sustained effort in marketing technical programs so that clients as well as industry can be better served. Strong linkages with clients and industry are crucial if the technical institutes are to serve as full partners in the economic growth and development of the state.

(Dr. Paul M. Starnes is President of DeKalb Technical Institute and Dr. Berman E. Johnson serves as its Associate Dean of Research and Planning)

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